HIGH RESOLUTION FAR INFRARED SPECTRUM IN THE LOWEST TRANS STATE OF CH_2DOH

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We extended our analysis of the ground state of the asymmetrically deuterated methanol CH_2DOH [1] to assign a large number of parallel and perpendicular subbands in the lowest trans torsional substate e_0 in the high resolution far infrared spectrum recorded in the range 30 - 350 cm^{-1}. The assigned lines span K_p values of up to about 12 and J values up to about 35. The interesting part of the spectrum is the appearance of the Q-branches. The Q-branches are well split and their positions are well away from that predicted from the rigid rotor model, indicating strong torsion rotation interaction in the molecule. The results will be presented in terms of the energy level diagram and the expansion model. Plausible assignments will also be presented for optically pumped far infrared laser lines in this molecule.

[1] I. Mukhopadhyay, D.S. Perry, Y-B Duan, J.C. Peterson, S. Albert, R.A.H. Butler, E. Herbst and F.C. DeLucia, J. Chem. Phys. 116, (2002).